SEQUENCE LISTING

<110> THE SALK INSTITUTE FOR BIOLOGICAL STUDIES
       THE REGENTS OF THE UNIVERSITY OF CALIFORNIA
       LILJEGREN, Sarah, Jean
       ECKER, Joseph, R.
       YANOFSKY, Martin, F.

<120> GENETIC CONTROL OF ORGAN ABSCISSION

<130> 532792001100

<140> 10/630,518
<141> 2003-07-29

<150> US 60/264,974
<151> 2001-01-29

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aag att ctt gaa ggg ctt ctt aaa cat cca gag aac aga gaa tgt gct      96
Lys Ile Leu Glu Gly Leu Leu Lys His Pro Glu Asn Arg Glu Cys Ala
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gac tgc aaa aca aaa ggt cca aga tgg gct agt gtt aat tta ggt atc     144
Asp Cys Lys Thr Lys Gly Pro Arg Trp Ala Ser Val Asn Leu Gly Ile
           35                  40                  45


ttt atc tgc atg caa tgt tct ggg att cac agg agt ctc ggg gta cac     192
Phe Ile Cys Met Gln Cys Ser Gly Ile His Arg Ser Leu Gly Val His
       50                  55                  60


ata tcg aag gtt cga tct gcc act ctg gac aca tgg ctc ccc gag cag     240
Ile Ser Lys Val Arg Ser Ala Thr Leu Asp Thr Trp Leu Pro Glu Gln
 65                  70                  75                  80
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1

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gtt gca ttt ata cag tca atg gga aat gat aaa gca aat agt tac tgg     288
Val Ala Phe Ile Gln Ser Met Gly Asn Asp Lys Ala Asn Ser Tyr Trp
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gaa gca gag cta ccc cca aac tat gat aga gtt gga att gag aat ttt     336
Glu Ala Glu Leu Pro Pro Asn Tyr Asp Arg Val Gly Ile Glu Asn Phe
            100                 105                 110

ata cgt gca aag tat gaa gag aag aga tgg gtt tct aga ggg gaa aag     384
Ile Arg Ala Lys Tyr Glu Glu Lys Arg Trp Val Ser Arg Gly Glu Lys
            115                 120                 125

gct aga tca cct cct aga gtc gag cag gaa cgg cgg aaa tct gtg gag     432
Ala Arg Ser Pro Pro Arg Val Glu Gln Glu Arg Arg Lys Ser Val Glu
        130                 135                 140

aga agt ggg ccg gga tat gag cat gga cat agt agt agt cct gta aat     480
Arg Ser Gly Pro Gly Tyr Glu His Gly His Ser Ser Ser Pro Val Asn
145                 150                 155                 160

ttg ttt gag gag agg aaa act att cca gca tct aga aca aga aat aat     528
Leu Phe Glu Glu Arg Lys Thr Ile Pro Ala Ser Arg Thr Arg Asn Asn
                165                 170                 175

gtt gct gca acg aga ata aat ctt ccc gtg cct ccc caa gga ccc agt     576
Val Ala Ala Thr Arg Ile Asn Leu Pro Val Pro Pro Gln Gly Pro Ser
            180                 185                 190

cag gtt ata aag cca cag cag aaa atg gag tct gca gct act cca gta     624
Gln Val Ile Lys Pro Gln Gln Lys Met Glu Ser Ala Ala Thr Pro Val
            195                 200                 205

gag agg gag aaa caa gca gta aat gtt gca cca gca tca gat cct cca     672
Glu Arg Glu Lys Gln Ala Val Asn Val Ala Pro Ala Ser Asp Pro Pro
        210                 215                 220

aag gtg gat ttt gct act gat ctg ttt aac atg cta tca atg gat gat     720
Lys Val Asp Phe Ala Thr Asp Leu Phe Asn Met Leu Ser Met Asp Asp
225                 230                 235                 240

tcg act aca aat acc tca gag gca act cct ggc gat act cct gcc gat     768
Ser Thr Thr Asn Thr Ser Glu Ala Thr Pro Gly Asp Thr Pro Ala Asp
                245                 250                 255

gat aac tca tgg gct ggc ttt cag tct gct gga agt ggt caa acg gca     816
Asp Asn Ser Trp Ala Gly Phe Gln Ser Ala Gly Ser Gly Gln Thr Ala
                260                 265                 270

gag aaa att gtc aca gcc aag cct gct gag agc agt tct cct cca gct     864
Glu Lys Ile Val Thr Ala Lys Pro Ala Glu Ser Ser Ser Pro Pro Ala
            275                 280                 285

tca tct tct gac ttt gag gat ttg ttt aag gac aca cct aat tta aca     912
Ser Ser Ser Asp Phe Glu Asp Leu Phe Lys Asp Thr Pro Asn Leu Thr
            290                 295                 300

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2

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Thr Gln Gln Ala Pro Lys Asp Val Lys Gly Asp Ile Met Ser Leu Phe
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gag aag acg aat ata gta tcg cct ttt gcc atg cat cag caa cag gtt    1008
Glu Lys Thr Asn Ile Val Ser Pro Phe Ala Met His Gln Gln Gln Val
                325                 330                 335

gct atg ctc gct cag cag caa gcc ctt tac atg gct gca gcg aaa gct    1056
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                340                 345                 350

gct gga ggc act cca aac ggc gtg aat caa caa gct att gct aat gct    1104
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            355                 360                 365

ctt aac gta gct tct gca aat tgg tca aac ccc ggc ggc tac cag atc    1152
Leu Asn Val Ala Ser Ala Asn Trp Ser Asn Pro Gly Gly Tyr Gln Ile
    370                 375                 380

ccc gga atg act aac ccc gta ggt ggt caa gct gat ctc cag aaa ctt    1200
Pro Gly Met Thr Asn Pro Val Gly Gly Gln Ala Asp Leu Gln Lys Leu
385                 390                 395                 400

atg caa aac atg aat atg aac gca aac atg aac acg aga ccc gca caa    1248
Met Gln Asn Met Asn Met Asn Ala Asn Met Asn Thr Arg Pro Ala Gln
                405                 410                 415

ccg caa gag aac act cta caa tac cca tca tcc agt ttc tac aca atg    1296
Pro Gln Glu Asn Thr Leu Gln Tyr Pro Ser Ser Ser Phe Tyr Thr Met
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ggt caa gct aat caa gtg aac ggt atg acc cca aac tca acc ggt aaa    1344
Gly Gln Ala Asn Gln Val Asn Gly Met Thr Pro Asn Ser Thr Gly Lys
            435                 440                 445

cct cag tca tca tcc gca acc caa cca aca agc acc aca cca tct tca    1392
Pro Gln Ser Ser Ser Ala Thr Gln Pro Thr Ser Thr Thr Pro Ser Ser
    450                 455                 460

caa tca ggc aaa gac ttt gat ttc tct tcc ttg atg gat gga atg ttc    1440
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Thr Lys His  *


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                  20                      25                          30
Asp Cys Lys Thr Lys Gly Pro Arg Trp Ala Ser Val Asn Leu Gly Ile
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Phe Ile Cys Met Gln Cys Ser Gly Ile His Arg Ser Leu Gly Val His
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Ile Ser Lys Val Arg Ser Ala Thr Leu Asp Thr Trp Leu Pro Glu Gln
65                      70                  75                      80
Val Ala Phe Ile Gln Ser Met Gly Asn Asp Lys Ala Asn Ser Tyr Trp
                85                  90                  95
Glu Ala Glu Leu Pro Pro Asn Tyr Asp Arg Val Gly Ile Glu Asn Phe
                100                 105                 110
Ile Arg Ala Lys Tyr Glu Glu Lys Arg Trp Val Ser Arg Gly Glu Lys
    115                     120                 125
Ala Arg Ser Pro Pro Arg Val Glu Gln Glu Arg Arg Lys Ser Val Glu
    130                     135                 140
Arg Ser Gly Pro Gly Tyr Glu His Gly His Ser Ser Ser Pro Val Asn
145                     150                 155                     160
Leu Phe Glu Glu Arg Lys Thr Ile Pro Ala Ser Arg Thr Arg Asn Asn
                165                 170                 175
Val Ala Ala Thr Arg Ile Asn Leu Pro Val Pro Pro Gln Gly Pro Ser
                180                 185                 190
Gln Val Ile Lys Pro Gln Gln Lys Met Glu Ser Ala Ala Thr Pro Val
                195                 200                 205
Glu Arg Glu Lys Gln Ala Val Asn Val Ala Pro Ala Ser Asp Pro Pro
    210                     215                 220
Lys Val Asp Phe Ala Thr Asp Leu Phe Asn Met Leu Ser Met Asp Asp
225                     230                 235                     240
Ser Thr Thr Asn Thr Ser Glu Ala Thr Pro Gly Asp Thr Pro Ala Asp
                245                 250                 255
Asp Asn Ser Trp Ala Gly Phe Gln Ser Ala Gly Ser Gly Gln Thr Ala
                260                 265                 270
Glu Lys Ile Val Thr Ala Lys Pro Ala Glu Ser Ser Ser Pro Pro Ala
    275                     280                 285
Ser Ser Ser Asp Phe Glu Asp Leu Phe Lys Asp Thr Pro Asn Leu Thr
    290                     295                 300
Thr Gln Gln Ala Pro Lys Asp Val Lys Gly Asp Ile Met Ser Leu Phe
305                     310                 315                     320
Glu Lys Thr Asn Ile Val Ser Pro Phe Ala Met His Gln Gln Gln Val
                325                 330                 335
Ala Met Leu Ala Gln Gln Gln Ala Leu Tyr Met Ala Ala Ala Lys Ala
                340                 345                 350
Ala Gly Gly Thr Pro Asn Gly Val Asn Gln Gln Ala Ile Ala Asn Ala
    355                     360                 365
Leu Asn Val Ala Ser Ala Asn Trp Ser Asn Pro Gly Gly Tyr Gln Ile
    370                     375                 380
Pro Gly Met Thr Asn Pro Val Gly Gly Gln Ala Asp Leu Gln Lys Leu
385                     390                 395                     400
Met Gln Asn Met Asn Met Asn Ala Asn Met Asn Thr Arg Pro Ala Gln
                405                 410                 415
Pro Gln Glu Asn Thr Leu Gln Tyr Pro Ser Ser Ser Phe Tyr Thr Met
                420                 425                 430
Gly Gln Ala Asn Gln Val Asn Gly Met Thr Pro Asn Ser Thr Gly Lys
                435                 440                 445
Pro Gln Ser Ser Ser Ala Thr Gln Pro Thr Ser Thr Thr Pro Ser Ser
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Thr Lys His

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 1               5                  10                  15

aag att ctt gaa ggg ctt ctt aaa cat cca gag aac aga gaa tgt gct      96
Lys Ile Leu Glu Gly Leu Leu Lys His Pro Glu Asn Arg Glu Cys Ala
                20                  25                  30

gac tgc aaa aca aaa ggt cca aga tgg gct agt gtt aat tta ggt atc     144
Asp Cys Lys Thr Lys Gly Pro Arg Trp Ala Ser Val Asn Leu Gly Ile
             35                  40                  45

ttt atc tac atg caa tgt tct ggg att cac agg agt ctc ggg gta cac     192
Phe Ile Tyr Met Gln Cys Ser Gly Ile His Arg Ser Leu Gly Val His
         50                  55                  60

ata tcg aag gtt cga tct gcc act ctg gac aca tgg ctc ccc gag cag     240
Ile Ser Lys Val Arg Ser Ala Thr Leu Asp Thr Trp Leu Pro Glu Gln
 65                  70                  75                  80

gtt gca ttt ata cag tca atg gga aat gat aaa gca aat agt tac tgg     288
Val Ala Phe Ile Gln Ser Met Gly Asn Asp Lys Ala Asn Ser Tyr Trp
                    85                  90                  95

gaa gca gag cta ccc cca aac tat gat aga gtt gga att gag aat ttt     336
Glu Ala Glu Leu Pro Pro Asn Tyr Asp Arg Val Gly Ile Glu Asn Phe
                100                 105                 110

ata cgt gca aag tat gaa gag aag aga tgg gtt tct aga ggg gaa aag     384
Ile Arg Ala Lys Tyr Glu Glu Lys Arg Trp Val Ser Arg Gly Glu Lys
            115                 120                 125

gct aga tca cct cct aga gtc gag cag gaa cgg cgg aaa tct gtg gag     432
Ala Arg Ser Pro Pro Arg Val Glu Gln Glu Arg Arg Lys Ser Val Glu
        130                 135                 140

aga agt ggg ccg gga tat gag cat gga cat agt agt agt cct gta aat     480
Arg Ser Gly Pro Gly Tyr Glu His Gly His Ser Ser Ser Pro Val Asn
145                 150                 155                 160

ttg ttt gag gag agg aaa act att cca gca tct aga aca aga aat aat     528
Leu Phe Glu Glu Arg Lys Thr Ile Pro Ala Ser Arg Thr Arg Asn Asn
                165                 170                 175
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5

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gtt gct gca acg aga ata aat ctt ccc gtg cct ccc caa gga ccc agt    576
Val Ala Ala Thr Arg Ile Asn Leu Pro Val Pro Pro Gln Gly Pro Ser
            180             185             190

cag gtt ata aag cca cag cag aaa atg gag tct gca gct act cca gta    624
Gln Val Ile Lys Pro Gln Gln Lys Met Glu Ser Ala Ala Thr Pro Val
            195             200             205

gag agg gag aaa caa gca gta aat gtt gca cca gca tca gat cct cca    672
Glu Arg Glu Lys Gln Ala Val Asn Val Ala Pro Ala Ser Asp Pro Pro
    210             215             220

aag gtg gat ttt gct act gat ctg ttt aac atg cta tca atg gat gat    720
Lys Val Asp Phe Ala Thr Asp Leu Phe Asn Met Leu Ser Met Asp Asp
225             230             235             240

tcg act aca aat acc tca gag gca act cct ggc gat act cct gcc gat    768
Ser Thr Thr Asn Thr Ser Glu Ala Thr Pro Gly Asp Thr Pro Ala Asp
            245             250             255

gat aac tca tgg gct ggc ttt cag tct gct gga agt ggt caa acg gca    816
Asp Asn Ser Trp Ala Gly Phe Gln Ser Ala Gly Ser Gly Gln Thr Ala
            260             265             270

gag aaa att gtc aca gcc aag cct gct gag agc agt tct cct cca gct    864
Glu Lys Ile Val Thr Ala Lys Pro Ala Glu Ser Ser Ser Pro Pro Ala
            275             280             285

tca tct tct gac ttt gag gat ttg ttt aag gac aca cct aat tta aca    912
Ser Ser Ser Asp Phe Glu Asp Leu Phe Lys Asp Thr Pro Asn Leu Thr
    290             295             300

act caa caa gca cca aaa gat gtg aaa ggc gat atc atg agc ctg ttt    960
Thr Gln Gln Ala Pro Lys Asp Val Lys Gly Asp Ile Met Ser Leu Phe
305             310             315             320

gag aag acg aat ata gta tcg cct ttt gcc atg cat cag caa cag gtt   1008
Glu Lys Thr Asn Ile Val Ser Pro Phe Ala Met His Gln Gln Gln Val
            325             330             335

gct atg ctc gct cag cag caa gcc ctt tac atg gct gca gcg aaa gct   1056
Ala Met Leu Ala Gln Gln Gln Ala Leu Tyr Met Ala Ala Ala Lys Ala
            340             345             350

gct gga ggc act cca aac ggc gtg aat caa caa gct att gct aat gct   1104
Ala Gly Gly Thr Pro Asn Gly Val Asn Gln Gln Ala Ile Ala Asn Ala
            355             360             365

ctt aac gta gct tct gca aat tgg tca aac ccc ggc ggc tac cag atc   1152
Leu Asn Val Ala Ser Ala Asn Trp Ser Asn Pro Gly Gly Tyr Gln Ile
            370             375             380

ccc gga atg act aac ccc gta ggt ggt caa gct gat ctc cag aaa ctt   1200
Pro Gly Met Thr Asn Pro Val Gly Gly Gln Ala Asp Leu Gln Lys Leu
385             390             395             400
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6

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atg caa aac atg aat atg aac gca aac atg aac acg aga ccc gca caa      1248
Met Gln Asn Met Asn Met Asn Ala Asn Met Asn Thr Arg Pro Ala Gln
                405                 410                 415

ccg caa gag aac act cta caa tac cca tca tcc agt ttc tac aca atg      1296
Pro Gln Glu Asn Thr Leu Gln Tyr Pro Ser Ser Ser Phe Tyr Thr Met
                420                 425                 430

ggt caa gct aat caa gtg aac ggt atg acc cca aac tca acc ggt aaa      1344
Gly Gln Ala Asn Gln Val Asn Gly Met Thr Pro Asn Ser Thr Gly Lys
                435                 440                 445

cct cag tca tca tcc gca acc caa cca aca agc acc aca cca tct tca      1392
Pro Gln Ser Ser Ser Ala Thr Gln Pro Thr Ser Thr Thr Pro Ser Ser
        450             455                 460

caa tca ggc aaa gac ttt gat ttc tct tcc ttg atg gat gga atg ttc      1440
Gln Ser Gly Lys Asp Phe Asp Phe Ser Ser Leu Met Asp Gly Met Phe
465             470                 475                 480

aca aaa cat tga                                                       1452
Thr Lys His  *
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<211> 483
<212> PRT
<213> Arabidopsis thaliana

<400> 4
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            20                  25                  30
Asp Cys Lys Thr Lys Gly Pro Arg Trp Ala Ser Val Asn Leu Gly Ile
            35                  40                  45
Phe Ile Tyr Met Gln Cys Ser Gly Ile His Arg Ser Leu Gly Val His
    50                  55                  60
Ile Ser Lys Val Arg Ser Ala Thr Leu Asp Thr Trp Leu Pro Glu Gln
65                  70                  75                  80
Val Ala Phe Ile Gln Ser Met Gly Asn Asp Lys Ala Asn Ser Tyr Trp
                85                  90                  95
Glu Ala Glu Leu Pro Pro Asn Tyr Asp Arg Val Gly Ile Glu Asn Phe
            100                 105                 110
Ile Arg Ala Lys Tyr Glu Glu Lys Arg Trp Val Ser Arg Gly Glu Lys
            115                 120                 125
Ala Arg Ser Pro Pro Arg Val Glu Gln Glu Arg Arg Lys Ser Val Glu
            130                 135                 140
Arg Ser Gly Pro Gly Tyr Glu His Gly His Ser Ser Ser Pro Val Asn
145                 150                 155                 160
Leu Phe Glu Glu Arg Lys Thr Ile Pro Ala Ser Arg Thr Arg Asn Asn
                165                 170                 175
Val Ala Ala Thr Arg Ile Asn Leu Pro Val Pro Pro Gln Gly Pro Ser
            180                 185                 190
Gln Val Ile Lys Pro Gln Gln Lys Met Glu Ser Ala Ala Thr Pro Val
            195                 200                 205
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Glu Arg Glu Lys Gln Ala Val Asn Val Ala Pro Ala Ser Asp Pro Pro
    210                 215                 220
Lys Val Asp Phe Ala Thr Asp Leu Phe Asn Met Leu Ser Met Asp Asp
225                 230                 235                 240
Ser Thr Thr Asn Thr Ser Glu Ala Thr Pro Gly Asp Thr Pro Ala Asp
                245                 250                 255
Asp Asn Ser Trp Ala Gly Phe Gln Ser Ala Gly Ser Gly Gln Thr Ala
            260                 265                 270
Glu Lys Ile Val Thr Ala Lys Pro Ala Glu Ser Ser Ser Pro Pro Ala
        275                 280                 285
Ser Ser Ser Asp Phe Glu Asp Leu Phe Lys Asp Thr Pro Asn Leu Thr
    290                 295                 300
Thr Gln Gln Ala Pro Lys Asp Val Lys Gly Asp Ile Met Ser Leu Phe
305                 310                 315                 320
Glu Lys Thr Asn Ile Val Ser Pro Phe Ala Met His Gln Gln Gln Val
                325                 330                 335
Ala Met Leu Ala Gln Gln Gln Ala Leu Tyr Met Ala Ala Ala Lys Ala
            340                 345                 350
Ala Gly Gly Thr Pro Asn Gly Val Asn Gln Gln Ala Ile Ala Asn Ala
        355                 360                 365
Leu Asn Val Ala Ser Ala Asn Trp Ser Asn Pro Gly Gly Tyr Gln Ile
    370                 375                 380
Pro Gly Met Thr Asn Pro Val Gly Gly Gln Ala Asp Leu Gln Lys Leu
385                 390                 395                 400
Met Gln Asn Met Asn Met Asn Ala Asn Met Asn Thr Arg Pro Ala Gln
                405                 410                 415
Pro Gln Glu Asn Thr Leu Gln Tyr Pro Ser Ser Ser Phe Tyr Thr Met
            420                 425                 430
Gly Gln Ala Asn Gln Val Asn Gly Met Thr Pro Asn Ser Thr Gly Lys
        435                 440                 445
Pro Gln Ser Ser Ser Ala Thr Gln Pro Thr Ser Thr Thr Pro Ser Ser
    450                 455                 460
Gln Ser Gly Lys Asp Phe Asp Phe Ser Ser Leu Met Asp Gly Met Phe
465                 470                 475                 480
Thr Lys His
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 1               5                  10                  15

aag att ctt gaa ggg ctt ctt aaa cat cca gag aac aga gaa tgt gct     96
Lys Ile Leu Glu Gly Leu Leu Lys His Pro Glu Asn Arg Glu Cys Ala
             20                  25                  30

gac tgc aaa aca aaa ggt cca aga tgg gct agt gtt aat tta ggt atc    144
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```
Asp Cys Lys Thr Lys Gly Pro Arg Trp Ala Ser Val Asn Leu Gly Ile
        35                  40                  45


ttt atc tgc atg caa tgt tct ggg att cac agg agt ctc ggg gta cac    192
Phe Ile Cys Met Gln Cys Ser Gly Ile His Arg Ser Leu Gly Val His
    50                  55                  60


ata tcg aag gtt cga tct gcc act ctg gac aca tgg ctc ccc gag cag    240
Ile Ser Lys Val Arg Ser Ala Thr Leu Asp Thr Trp Leu Pro Glu Gln
65                  70                  75                  80


gtt gca ttt ata cag tca atg gga aat gat aaa gca aat agt tac tgg    288
Val Ala Phe Ile Gln Ser Met Gly Asn Asp Lys Ala Asn Ser Tyr Trp
                85                  90                  95


gaa gca gag cta ccc cca aac tat gat aga gtt gga att gag aat ttt    336
Glu Ala Glu Leu Pro Pro Asn Tyr Asp Arg Val Gly Ile Glu Asn Phe
                100                 105                 110


ata cgt gca aag tat gaa gag aag aga tgg gtt tct aga ggg gaa aag    384
Ile Arg Ala Lys Tyr Glu Glu Lys Arg Trp Val Ser Arg Gly Glu Lys
            115                 120                 125


gct aga tca cct cct aga gtc gag cag gaa cgg cgg aaa tct gtg gag    432
Ala Arg Ser Pro Pro Arg Val Glu Gln Glu Arg Arg Lys Ser Val Glu
        130                 135                 140


aga agt ggg ccg gga tat gag cat gga cat agt agt agt cct gta aat    480
Arg Ser Gly Pro Gly Tyr Glu His Gly His Ser Ser Ser Pro Val Asn
145                 150                 155                 160


ttg ttt gag gag agg aaa act att cca gca tct aga aca aga aat aat    528
Leu Phe Glu Glu Arg Lys Thr Ile Pro Ala Ser Arg Thr Arg Asn Asn
                165                 170                 175


gtt gct gca acg aga ata aat ctt ccc gtg cct ccc caa gga ccc agt    576
Val Ala Ala Thr Arg Ile Asn Leu Pro Val Pro Pro Gln Gly Pro Ser
        180                 185                 190


cag gtt ata aag cca tag cagaaaatgg agtctgcagc tactccagta ·         624
Gln Val Ile Lys Pro  *
        195


gagagggaga aacaagcagt aaatgttgca ccagcatcag atcctccaaa ggtggatttt 684
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            20                  25                  30
Asp Cys Lys Thr Lys Gly Pro Arg Trp Ala Ser Val Asn Leu Gly Ile
        35                  40                  45
Phe Ile Cys Met Gln Cys Ser Gly Ile His Arg Ser Leu Gly Val His
    50                  55                  60
Ile Ser Lys Val Arg Ser Ala Thr Leu Asp Thr Trp Leu Pro Glu Gln
65                  70                  75                  80
Val Ala Phe Ile Gln Ser Met Gly Asn Asp Lys Ala Asn Ser Tyr Trp
                85                  90                  95
Glu Ala Glu Leu Pro Pro Asn Tyr Asp Arg Val Gly Ile Glu Asn Phe
            100                 105                 110
Ile Arg Ala Lys Tyr Glu Glu Lys Arg Trp Val Ser Arg Gly Glu Lys
            115                 120                 125
Ala Arg Ser Pro Pro Arg Val Glu Gln Glu Arg Arg Lys Ser Val Glu
            130                 135                 140
Arg Ser Gly Pro Gly Tyr Glu His Gly His Ser Ser Ser Pro Val Asn
145                 150                 155                 160
Leu Phe Glu Glu Arg Lys Thr Ile Pro Ala Ser Arg Thr Arg Asn Asn
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11

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13

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Ser Leu Asp Glu Glu Ile Leu Leu His His Val Leu Gln Val Thr Pro
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Pro Glu Thr Arg Thr Arg Ala Gly Ser Val Asp Met Lys Glu Asn Val
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14

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Ser Glu Ile Gln Ile Lys Lys Met Asp Ala Gly Gly Asn Glu Arg Leu
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Asn Asn Phe Leu Ala Gln Tyr Gly Ile Ser Lys Glu Thr Asp Ile Ile
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Ser Lys Tyr Asn Ser Asn Ala Ala Ser Val Tyr Arg Asp Arg Ile Gln
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Ala Leu Ala Glu Gly Arg Gln Trp Arg Asp Pro Pro Ile Val Lys Glu
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Ser Val Gly Gly Gly Leu Met Asn Lys Lys Pro Pro Leu Ser Gln Gly
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Gly Gly Arg Asp Ser Gly Asn Gly Gly Trp Asp Asn Trp Asp Asn Asp
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15

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Glu Asp Ile Tyr Ser Arg Ser Gln Leu Glu Ala Ser Ala Ala Asn Lys
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Glu Ser Phe Phe Ala Lys Arg Met Ala Glu Asn Glu Ser Lys Pro Glu
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         225                      230                      235                      240
Pro Gly Pro Ala Pro Arg Ser Asn Gln Gln Ser Gly Gly Gly Asp Val
                     245                      250                      255
Phe Ser Val Met Ser Glu Gly Phe Gly Arg Leu Ser Leu Val Ala Ala
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Ser Ala Ala Asn Val Val Gln Thr Gly Thr Met Glu Phe Thr Ser Lys
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Val Lys Glu Gly Gly Leu Asp Gln Thr Val Ser Glu Thr Val Asn Val
                 290                      295                      300
Val Ala Ser Lys Thr Thr Glu Ile Gly Gln Arg Thr Trp Gly Ile Met
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Lys Gly Val Met Ala Ile Ala Ser Gln Lys Val Glu Glu Phe Thr Lys
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Glu Glu Ala Ser Thr Trp Asn Gln Gln Asn Lys Thr Glu Gly Asn Gly
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Tyr Tyr Gln Asn Ser Gly Ile Gly Asn Lys Thr Ala Asn Ser Ser Phe
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Gly Gly Ser Gln Ser Ser Ser Ser Gly His Asn Asn Ser Tyr Arg Asn
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Ser Asn Ser Trp Asp Asp Trp Gly Glu Glu Asn Asn Ser Lys Lys Glu
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Ala Ala Pro Lys Val Ser Thr Ser Asn Asp Asp Asp Gly Gly Trp
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Ala Gly Trp Asp Asp Asn Asp Ala Lys Asp Asp Asp Phe Tyr Tyr Gln
                     420                      425                      430
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Ala Trp Thr Gly Gly Gly Phe Leu
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<213> Arabidopsis thaliana

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16

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<212> PRT
<213> Arabidopsis thaliana

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Asp Pro Arg Asp Arg Leu Glu Lys Leu Leu Lys Gln Pro Gly Asn Lys
        35   40   45
Tyr Cys Ala Asp Cys Gly Ser Pro Glu Pro Lys Trp Val Ser Leu Ser
    50   55   60
Leu Gly Val Phe Ile Cys Ile Lys Cys Ser Gly Val His Arg Ser Leu

17

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65                      70                      75                      80
Gly Val His Ile Ser Lys Val Leu Ser Val Lys Leu Asp Glu Trp Thr
                85                      90                      95
Asp Asp Gln Val Asp Met Leu Val Gly Tyr Gly Gly Asn Thr Ala Val
                100                     105                     110
Asn Glu Arg Phe Glu Ala Cys Asn Ile Asp Gln Ser Lys Lys Pro Lys
            115                     120                     125
Pro Asp Ser Thr Asn Glu Glu Arg Asn Asp Phe Ile Arg Lys Lys Tyr
        130                     135                     140
Glu Gln His Gln Phe Met Asp Pro Lys Asp Gly Ala Leu Cys Thr Tyr
145                     150                     155                     160
Gln Gln Pro Ser Arg Thr Asn Thr Ser Pro Pro Ser Leu Cys Ser Ala
                165                     170                     175
Ser His Arg Ser Thr Lys Asn Arg Ile Gly His Ala Phe Arg Asn Ser
            180                     185                     190
Trp Gly Arg Arg Glu Ser Asp His Lys Gly Pro Lys Lys Ser Asn Ser
        195                     200                     205
Met Ala Gly Met Val Glu Phe Val Gly Leu Ile Lys Val Asn Val Val
        210                     215                     220
Lys Gly Thr Asn Leu Ala Val Arg Asp Val Met Thr Ser Asp Pro Tyr
225                     230                     235                     240
Val Ile Leu Ala Leu Gly Gln Gln Ser Val Lys Thr Arg Val Ile Lys
                245                     250                     255
Asn Asn Leu Asn Pro Val Trp Asn Glu Thr Leu Met Leu Ser Ile Pro
            260                     265                     270
Glu Pro Met Pro Pro Leu Lys Val Leu Val Tyr Asp Lys Asp Thr Phe
        275                     280                     285
Ser Thr Asp Asp Phe Met Gly Glu Ala Glu Ile Asp Ile Gln Pro Leu
        290                     295                     300
Val Ser Ala Ala Lys Ala Tyr Glu Thr Ser Ser Ile Lys Glu Pro Met
305                     310                     315                     320
Gln Leu Gly Ser Trp Val Ala Ser Lys Glu Asn Thr Leu Val Ser Asp
                325                     330                     335
Gly Ile Ile Leu Leu Glu Asp Gly Lys Val Lys Gln Asp Ile Ser Leu
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18

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19

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<213> Arabidopsis thaliana

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            35                  40                  45
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        50                  55                  60
Ser Ala Ile Gln Ile Lys Lys Met Glu Ala Gly Gly Asn Glu Arg Leu
65                  70                  75                  80
Asn Lys Phe Phe Ala Gln Tyr Gly Ile Ala Lys Glu Thr Asp Ile Ile
                85                  90                  95
Ser Lys Tyr Asn Ser Asn Ala Ala Ser Val Tyr Arg Asp Arg Ile Gln
                100                 105                 110
Ala Leu Ala Glu Gly Arg Pro Trp Asn Asp Pro Pro Val Val Lys Glu
            115                 120                 125
Ala Asn Lys Lys Pro Pro Leu Ala Gln Gly Gly Tyr Gly Asn Asn Asn
        130                 135                 140
Asn Asn Asn Asn Gly Gly Trp Asp Ser Trp Asp Asn Asp Asp Ser Tyr
145                 150                 155                 160
Lys Ser Asp Met Arg Arg Asn Gln Ser Ala Asn Asp Phe Arg Ala Ser
                165                 170                 175
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20

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Gly Asn Arg Glu Gly Ala His Val Lys Ser Lys Ser Ser Glu Asp Ile
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            195                 200                 205
Phe Ala Arg Arg Met Ala Glu Asn Glu Ser Lys Pro Glu Gly Leu Pro
    210                 215                 220
Pro Ser Gln Gly Gly Lys Tyr Val Gly Phe Gly Ser Ser Ser Ala Pro
225                 230                 235                 240
Pro Pro Arg Asn Asn Gln Gln Asp Asp Val Phe Ser Val Val Ser Gln
            245                 250                 255
Gly Phe Gly Arg Leu Ser Leu Val Ala Ala Ser Ala Ala Gln Ser Ala
            260                 265                 270
Ala Ser Val Val Gln Thr Gly Thr Lys Glu Phe Thr Ser Lys Val Lys
    275                 280                 285
Glu Gly Gly Tyr Asp His Lys Val Ser Glu Thr Val Asn Val Val Ala
    290                 295                 300
Asn Lys Thr Thr Glu Ile Gly His Arg Thr Trp Gly Ile Met Lys Gly
305                 310                 315                 320
Val Met Ala Met Ala Thr Gln Lys Val Glu Glu Phe Thr Lys Glu Gly
            325                 330                 335
Ser Thr Ser Trp Asn Gln Gln Ser Glu Asn Glu Gly Asn Gly Tyr Tyr
            340                 345                 350
Gln Asn Phe Gly Asn Gly Asn Lys Ala Ala Asn Ser Ser Val Gly Gly
            355                 360                 365
Gly Arg Pro Gln Ser Ser Ser Thr Ser Gly His Tyr Asn Asn Ser Gln
    370                 375                 380
Asn Ser Asn Ser Trp Asp Ser Trp Gly Glu Asn Glu Asn Lys Lys Thr
385                 390                 395                 400
Glu Ala Val Ala Pro Lys Gly Ser Ser Ala Ser Asn Asp Asp Asp Gly
            405                 410                 415
Trp Thr Gly Trp Asp Asp His Asp Ala Lys Asp Asp Gly Phe Asp Gly
            420                 425                 430
His Tyr Gln Ser Ala Gly Asp Lys Lys Ser Ala Gly His Asn Gly Lys
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tcatctttt tttttaaata tcatttcatt atgttcattt tattaaaaat cagtttgaac 780
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21

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27

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<212> PRT
<213> Arabidopsis thaliana

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Gly Ile Phe Ile Cys Met Gln Cys Ser Gly Ile His Arg Ser Leu Gly
        35                  40                  45
Val His Ile Ser Lys Val Arg Ser Ala Thr Leu Asp Thr Trp Leu Pro
    50                  55                  60
Glu Gln Val Ala Phe Ile Gln Ser Met Gly Asn Asp Lys Ala Asn Ser
65                  70                  75                  80
Tyr Trp Glu Ala Glu Leu Pro Pro Asn Tyr Asp Arg Val Gly Ile Glu
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<210> 23
<211> 104
<212> PRT
<213> Rattus norvegicus

<400> 23

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Cys Phe Glu Cys Gly Ala Pro Asn Pro Gln Trp Val Ser Val Thr Tyr
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Gly Ile Trp Ile Cys Leu Glu Cys Ser Gly Arg His Arg Gly Leu Gly
        35                  40                  45
Val His Leu Ser Phe Val Arg Ser Val Thr Met Asp Lys Trp Lys Asp
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```
          50                    55                    60
Ile Glu Leu Glu Lys Met Lys Ala Gly Gly Asn Ala Lys Phe Arg Glu
65                    70                    75                    80
Phe Leu Glu Ala Gln Asp Asp Tyr Glu Pro Ser Trp Ser Leu Gln Asp
                    85                    90                    95
Lys Tyr Ser Ser Arg Ala Ala Ala
                    100


<210> 24
<211> 101
<212> PRT
<213> Sacharomyces cerevisiae

<400> 24
Thr Arg Arg Arg Leu Leu Gln Leu Gln Lys Ile Gly Ala Asn Lys Lys
 1               5                    10                    15
Cys Met Asp Cys Gly Ala Pro Asn Pro Gln Trp Ala Thr Pro Lys Phe
                20                    25                    30
Gly Ala Phe Ile Cys Leu Glu Cys Ala Gly Ile His Arg Gly Leu Gly
            35                    40                    45
Val His Ile Ser Phe Val Arg Ser Ile Thr Met Asp Gln Phe Lys Pro
    .50                    55                    60
Glu Leu Leu Arg Met Glu Lys Gly Gly Asn Glu Pro Leu Thr Glu Trp
65                    70                    75                    80
Phe Lys Ser His Asn Ile Asp Leu Ser Pro Gln Lys Val Lys Tyr Asp
                85                    90                    95
Asn Pro Val Ala Glu
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<210> 25
<211> 113
<212> PRT
<213> Drosophila melanogaster

<400> 25
Cys Gln Thr Leu Leu Thr Gln Met Leu Arg Asp Glu Asp Asn Lys Tyr
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Cys Val Asp Cys Asp Ala Lys Gly Pro Arg Trp Ala Ser Trp Asn Leu
                20                    25                    30
Gly Met Phe Leu Cys Ile Arg Cys Ala Gly Ile His Arg Asn Leu Gly
            35                    40                    45
Val His Ile Ser Arg Val Lys Ser Val Asn Leu Asp Thr Trp Thr Pro
            50                    55                    60
Glu Gln Val Ile Ser Leu Gln Gln Met Gly Asn Ser Arg Ala Arg Ala
65                    70                    75                    80
Val Tyr Glu Ala Gln Leu Pro Asp Gly Phe Arg Arg Pro Gln Thr Asp
                85                    90                    95
Thr Ala Leu Glu Asn Phe Ile Arg Ala Lys Tyr Asp His Lys Lys Tyr
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Leu


<210> 26
<211> 113
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<212> PRT
<213> Caenorhabditis elegans

<400> 26
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Cys Ala Asp Cys Gln Ala Lys Thr Pro Arg Trp Ala Ala Trp Asn Leu
            20              25              30
Gly Ile Phe Ile Cys Ile Arg Cys Ala Gly Ile His Arg Asn Leu Gly
        35              40              45
Val His Ile Ser Arg Val Asn Ser Val Asn Leu Asp Ser Trp Thr Pro
    50              55              60
Glu Gln Val Gln Ile Met Arg Val Met Gly Asn Glu Lys Ala Arg Gln
65                  70              75                  80
Val Tyr Glu His Asp Leu Pro Ala Gln Phe Arg Arg Pro Thr Asn Asp
                85              90              95
Gln Gln Met Glu Gln Pro Ile Arg Ser Lys Tyr Glu Gln Lys Arg Tyr
            100             105             110
Ile
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